

1 WHAT IS CLAIMED IS:

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3 1. A process for repetitively producing and removing coke from a delayed
4 coker vessel, wherein the coker vessel has a bottom portion defining
5 an aperture through which coke is released, comprising:

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7 (a) Sealing an aperture closure housing to the bottom portion of the
8 coker vessel;

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10 (b) moving a closure member within the closure housing to close
11 the aperture;

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13 (c) feeding a heavy hydrocarbon feed into the coker vessel through
14 a feed line attached to the coker vessel at a position above the
15 bottom of the coker vessel;

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17 (d) coking the heavy hydrocarbon in the coker vessel;

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19 (e) moving the closure member within the closure housing to open
20 the aperture to allow coke removal from the coker vessel; and

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22 (f) releasing coke through the aperture, and;

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24 (g) repeating steps c through f successively.

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26 2. The process in of Claim 1 wherein step (c) further comprises attaching
27 the feed line to the coker vessel at a side entry position.

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29 3. The process in of Claim 1 wherein step (a) further comprises sealing a
30 transition spool piece to the coker vessel bottom and attaching the feed
31 line to the spool piece at a side entry position.

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33 4. The process of Claim 1 wherein step (a) further comprises forming a
34 seal between the aperture closure housing and the bottom portion of

- 1 the vessel wherein the seal withstands pressures within the vessel
- 2 from atmospheric to 500 psi.
- 3
- 4 5. The process of Claim 4 wherein step (a) further comprises forming a
- 5 seal between the aperture closure housing and the bottom portion of
- 6 the vessel wherein the seal withstands vessel temperatures through
- 7 repetitive coking/decoking cycles ranging from -50°F to 1000°F .
- 8
- 9 6. The process of Claim 1 wherein step (a) further comprises sealing a
- 10 coke chute to a bottom portion of the aperture closure housing.
- 11
- 12 7. The process of Claim 1 wherein step (a) further comprises placing a
- 13 gasket between the bottom portion of the vessel and closure unit and
- 14 pressure-tightly joining the vessel bottom, the gasket and the closure
- 15 unit.
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- 17 8. The process of Claim 2 wherein step (a) further comprises placing a
- 18 gasket between the bottom of the closure unit and the coke chute and
- 19 pressure-tightly joining the closure unit, the gasket and the coke chute.
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- 21 9. The process of Claim 7 or 8 wherein the gasket comprises an annular
- 22 corrugated metal bonded to a graphite material.
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- 24 10. A process in accordance with Claim 6 wherein the process further
- 25 comprises using the chute to assist in directing coke removed from the
- 26 coker vessel into a coke receiving area.
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- 28 11. A process in accordance with Claim 1 wherein steps (b) and (e) further
- 29 comprise moving the closure member by a powered actuator or a
- 30 plurality of powered actuators.
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- 32 12. The process of Claim 11 wherein said powered actuators are remotely
- 33 actuated.

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- 2 13. A process in accordance with Claim 1 wherein the coking step (d) is
- 3 carried out at a temperature between 900°F and 1100°F, the opening
- 4 step (e) is done at a temperature between -50°F and 110°F, and the
- 5 valve is selected to withstand repeated operation at temperature
- 6 cycling between step (d) and step (e).
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- 8 14. A process in accordance with Claim 1 wherein the closure member of
- 9 steps (b) and (e) is a valve.
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- 11 15. A process in accordance with Claim 14 wherein the valve is selected
- 12 from a gate valve, a ball valve, a slide valve, a knife valve or a wedge
- 13 plug valve.
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- 15 16. A process in accordance with Claim 1 wherein the aperture opens to a
- 16 diameter between 30 and 90 inches.
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- 18 17. A process in accordance with Claim 1 wherein the closure housing and
- 19 closure member are mounted to a weight bearing structure selected
- 20 from the group consisting of a gantry system and a trolley system.
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- 22 18. The process of Claim 17 wherein the closure unit is laterally removable
- 23 from the coker vessel by means of said weight bearing structure.
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- 25 19. A coker vessel comprising:
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- 27 (a) a vessel having a flanged side aperture and a flanged bottom
- 28 aperture;
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- 30 (b) a flanged feed pipe fitted to said flanged side aperture;
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- 32 (c) an aperture closure unit fitted and sealed to said bottom
- 33 aperture;

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- 2 (d) a closure member moveable within said closure unit;
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- 4 (e) A coke chute sealed to the bottom portion of the closure unit for
- 5 directing coke from the vessel to a receiving area.
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- 7 20. The coker vessel of Claim 19 wherein the closure member comprises a
- 8 valve.
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- 10 21. The coker vessel of Claim 20 wherein the valve is a gate valve, a ball
- 11 valve, a slide valve, a knife valve or a wedge plug valve.
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- 13 22. The coker vessel of Claim 20 wherein the valve further comprises a
- 14 power actuated valve.
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- 16 23. The coker vessel of Claim 20 wherein the bottom aperture is from 30 to
- 17 90 inches.